

NARRATIVE

TO: Jeng-Hon Su
FROM: Ginger Payment
DATE: March 9, 2022

Facility Name: **Southern Graphic Systems, LLC**
AIRS No.: 067-00252
Location: Marietta, GA (Cobb County)
Application #: 28142
Date of Application: October 5, 2022

Background Information

Southern Graphic Systems, LLC (hereinafter “facility”) is an existing flexographic plate manufacturing facility located at 3045 Chastain Meadows Parkway in Marietta (Cobb County). The facility operates with Permit No. 3555-067-0252-S-02-0 which was issued on May 31, 2019 for the installation of additional plate making equipment and for a change in the synthetic minor VOC emission limit from 25 tpy to 100 tpy.

The plates are made by curing the print image film to a polymer sheet by use of UV light exposure. The portion of the film that is not exposed to UV light is washed out, leaving the image on the polymer sheet. The facility recycles and reuses the spent solvent in a distillation unit on-site. The polymer sheet is the coated with a primer and adhesive as is the mounting plate to which it is joined. The edges of the final plate are sealed.

The facility manufactures two types of flexographic plates: Sheet Photopolymer Flexographic Plates (SPFP) and Liquid Polymer Flexographic Plates (LPFP). In the SPFP process, the facility currently operates four solvent based plate processors (ID Nos. PPD1, PPD3, PPD4, and PPD5) and two water-based plate processors. In the LPFP process, the facility currently operates two plate processors. The solvent based SPFP processors are the only significant emission sources.

Purpose of Application

Application No. 28142 was submitted on October 5, 2021 for the installation of a new plate processor (PPD8) which will replace an existing plate processor (PPD2). The Dryer for PPD2 will remain in place and will be paired with the new replacement processor.

The application also requests to adjust the model numbers for two units. The removal of DuPont 3000BP Cyrel Processor (in Emission Unit ID PPD6) and to be replaced by the Vianord Engineering EV05 BP Processor which was identified as Emission Unit ID PPD7 in Permit Number 3555-067-0252-S-02-0. The Dryer for PPD6 will remain in place and will be paired with PPD7 processor.

Two digital imaging units (CDI-7 and CDI-3) were replaced with new ones and a new digital imaging unit was added.

The Division requested a completed SIP application on October 20, 2021 and the completed SIP application was received on February 8, 2022.

A Public Advisory (PA0222-2) was issued on February 9, 2022 and expired on March 11, 2022.

Updated Equipment List

Emission Units			Associated Control Devices	
Source Code	Description	Installation Date	Source Code	Description
ST01	Solvent recovery and recycle stills	2012	--	--
ST02	Solvent recovery and recycle stills	2019	--	--
PPD1	Plate Processor (plate washout, dryer and finisher)	02/2012	--	--
PPD2	Dryer for PPD8	04/2019	--	--
PPD3	Plate Processor (plate washout, dryer and finisher)	02/2012	--	--
PPD4	Plate Processor (plate washout, dryer and finisher)	12/2014	--	--
PPD5	Plate Processor (plate washout, dryer and finisher)	08/2018	--	--
PPD6	Dryer for PPD7	04/2019	--	--
PPD7	Plate Processor (plate washout and finisher)	04/2019	--	--
PPD8*	Plate Processor (plate washout and finisher)	2022	--	--

*proposed within current application

Two digital imaging units (CDI-7 and CDI-3) were replaced with new ones and a new digital imaging unit was added. The digital imaging units are a source of particulate matter due to laser etching of images on plates prior to transfer to the plate processors. The burning of the image on a substrate results in dust, which is caught on a HEPA filter prior to exhausting the emission to the outside of the building through a vent. The particulate matter emissions from each unit is 13.84 lb/yr of PM emissions. These units are exempt from permitting with Rule 391-3-1-.03(6)(i)(3)(iii) which concerns cumulative modifications. There are a total of eight imaging units.

A 60 kW natural gas fired emergency generator was exempted in Application No. 23744. The generator is a stationary spark ignition (SI) internal combustion engine (ICE) constructed after June 12, 2006 and manufactured after July 1, 2008, it is subject to 40 CFR 60 Subpart JJJJ – *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*. It is also subject to 40 CFR 63 Subpart ZZZZ – *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*. Note that an emergency generator is exempted from permitting per GA Rule 391-3-1-.03(6)(b)11.(i); therefore, it is not included in the permit.

Emissions Summary

VOC emissions are based on maximum product usage and the VOC/HAP content based on the SDS. In addition, the emissions include a 20% safety factor to ensure the worst-case scenario for product usage.

PM emissions are based on the assumption of 3,375 plate/yr/unit which is the potential plate production per digital imaging unit and a PM emission factor of 0.0041 lb PM/plate.

Facility-Wide Emissions (in tons per year)

Pollutant	Potential Emissions			Actual Emissions		
	Before Mod.	After Mod.	Emissions Change	Before Mod.	After Mod.	Emissions Change
PM/PM ₁₀ /PM _{2.5}	<1	<1	0	<1	<1	0
NO _x	0	0	--	0	0	--
SO ₂	0	0	--	0	0	--
CO	0	0	--	0	0	--
VOC	<100	<100	0	<100	<100	0
Max. Individual HAP	<10	<10	0	<10	<10	0
Total HAP	<25	<25	0	<25	<25	0
Total GHG (if applicable)	0	0	--	0	0	--

Regulatory Applicability

The plate processors will continue to Georgia Rule (b) - *Visible Emissions* and Georgia Rule (e) - *Particulate Emission from Manufacturing Processes*.

GA Rule (tt) and RACT Determination:

During Application No. 26959, a RACT determination was conducted for the increase in the VOC emission limit from 25 tpy to 100 tpy.

Since the facility is located in Cobb County, the VOC cap was raised above 25 tpy and was not subject to any specific GA VOC rules. Therefore, the facility is subject to the Reasonably Available Control Technology (RACT) requirements specified in Georgia Rules for Air Quality Control 391-3-1-.02(2)(tt)1. The facility submitted a VOC RACT Plan on February 20, 2019 for all of its emission units. The Division's VOC RACT Determinations are as follows:

- Potential VOC emissions from all the processes/emission units other than the six solvent based SPFP processors are so small that they do not warrant a VOC RACT for the emission units.

- The washout and dryers of each solvent based SPFP processors are the main source of VOC. The facility provided the following top-down list for potential VOC RACT –
 - Thermal Oxidation
 - Catalytic Oxidation
 - Carbon Adsorption
 - Chilled Condensers
 - Material Substitution
 - Proper Equipment Design, Work Practices, and Maintenance
- The facility ruled out some of the potential VOC RACT because –
 - Carbon Adsorption was determined to be technically infeasible because the targeted VOCs have an average molecular weight greater than 130, and therefore are difficult to be recovered from the activated carbon bed, and thus affect the bed's ability to adsorb more VOCs.
 - Chilled Condensers were determined to be technically infeasible because the exhaust VOC concentration, 153 ppmv, is too low. The facility cited U.S. EPA that chilled condensers are used to control streams with VOC concentrations above 5,000 ppmv. Use of a chilled condenser is not only ineffective but would also increase the facility's water demand and generate additional wastewater.
 - Material Substitution are determined to be technically infeasible because using low vapor pressure materials, in practice, it showed no reduction in VOC emissions. If the facility opts to measure the actual VOC emissions instead of assuming all VOC would become airborne (mass balance), it would require testing for each type of low vapor pressure material. The facility claimed that testing, which requires draining all processors/distillation units, cleaning all equipment, introducing new materials to the equipment, and running the new materials for several months to establish a reliable "usage" count, would be costly, and would most likely impact production delivery timelines.
- For the remaining available RACT options, the facility ruled out the following potential VOC RACT based on economical infeasibility –
 - The facility estimated the annualized cost effectiveness for Thermal Oxidation as USD\$16,851 per ton VOC removed. Therefore, the facility claimed that Thermal Oxidation is not cost effective.
 - The facility estimated the annualized cost effectiveness for Catalytic Oxidation as USD\$11,498 per ton VOC removed. Therefore, the facility claimed that Catalytic Oxidation is not cost effective.
- The only remaining VOC RACT option that was both technically and economically feasible was Proper Equipment Design, Work Practices, and Maintenance. The facility proposed the following work practices:
 - Keeping VOC containing material containers closed while not in use.
 - Prompt cleanup of spills.
 - Prompt repair of drips.

- Storage of VOC-laden cleaning rags in closed containers.
- Manage washout time and temperature.
- Transfer thick plate work to Liquid Photopolymer Lines where possible (which will result in a reduction in VOC emissions).
- Manage solvent quality that is produced in the distillation units.

The Division agreed with the facility's RACT determination that the VOC RACT is Proper Equipment Design, Work Practices, and Maintenance. The work practice standards are included in Condition 2.5 of the Permit No. 3555-067-0252-S-02-0 as its VOC RACT requirements. These VOC RACT requirements will continue to be applicable to the proposed plate processor.

Permit Conditions

Condition 7.7 was modified to require a startup notification for the proposed plate processors PPD7 and PPD8.

Toxic Impact Assessment

The HAP emissions will remain capped below 10/25 tpy after the proposed modification. Since there is not HAP emission increases, no TIA is needed.

Summary & Recommendations

I recommend issuance of Permit Amendment No. 3555-067-0252-S-02-1 to Southern Graphic Systems, LLC for the installation of a new plate processor (PPD8), adjusting the model numbers for two units and for the installation of two replacement digital imaging units and one new digital imaging unit. All conditions of Permit No. 3555-067-0252-S-02-0 will remain applicable. A public notice was issued for this application and expired on March 11, 2022. No comments were received.